

WHAT IS CLAIMED IS:

1. A composition comprising:

a non-silicone material;  
a silicone material; and  
a crosslinking agent;

5 wherein the composition forms a structure selected from the group consisting of an interpenetrating network structure and a thermoplastic vulcanizate structure.

2. The composition according to claim 1, wherein the interpenetrating network structure is a semi-interpenetrating network.

3. The composition according to claim 1, wherein the interpenetrating network structure is a fully interpenetrating network.

4. The composition according to claim 1, wherein the non-silicone material is selected from the group consisting of a monomer, an oligomer, a prepolymer, and a polymer.

5. The compositions according to claim 1, wherein the composition is formed by blending the silicone material and the non-silicone material, and polymerizing/curing the blend of the silicone material and non-silicone material mixture with the crosslinking agent.

6. The composition according to claim 1, wherein the composition is formed under conditions suitable for inducing polymerization/crosslinking selected from the group consisting of an application of thermal energy, an application of uv radiation, and an application of electron beam radiation.

7. The composition according to claim 1, wherein the non-silicone material is selected from the group consisting of urethanes, polyepoxides, polyesters, polyamides, polyimides, phenolics, polysiloxanes, sulfides, acrylics, poly (styrenebutadiene), poly (styrene-acrylonitrile), poly (butadiene-acrylonitrile), polychloroprene, poly (chloroprene-acrylonitrile),

5 poly (acrylonitrile-butadiene-styrene), poly (meth)acrylates, poly (2,6-dimethyl-1,4-phenyleneoxide), polycarbonates, styrene-ethylene-butylene-styrene (SEBS) block copolymers, polyolefins, polyacetals, styrene-butadiene copolymers, polyolefin elastomers, polyamide-polyether elastomer base resins, copolymeric ionomers, terpolymeric ionomers, butadiene polymers, butadiene copolymers, thermoset polymer, syndiotactic polybutadiene, 10 epoxides, imides, dienes, and mixtures thereof.

8. The composition according to claim 1, wherein the crosslinking agent is selected from the group consisting of a sulfur compound, a precious metal-containing material, a peroxide, a crosslinking initiator, and mixtures thereof.

9. The composition according to claim 8, wherein the sulfur compound is a sulfur donor.

10. The composition according to claim 8, wherein a precious metal included in the precious metal-containing material is selected from the group consisting of rhodium, ruthenium, palladium, osmium, iridium, and platinum.

11. The composition according to claim 8, wherein the peroxide is selected from the group consisting of organic peroxides, aliphatic peroxides, aromatic peroxides, and mixtures thereof.

12. The composition according to claim 8, wherein the crosslinking initiator is selected from the group consisting of organic azo compounds and phenolic crosslinking initiators.

13. The composition according to claim 1, further comprising compounds selected from the group consisting of colorants, stabilizers, optical brighteners, antioxidants, processing aids, mold release agents, organic fillers, inorganic fillers, metallic fillers, organic fibers, inorganic fibers, metallic fibers, continuous fibers, non-continuous fibers, and mixtures thereof.

14. The composition according to claim 1, wherein the non-silicone material is dispersed in a phase of the silicone material.

15. The composition according to claim 1, wherein the silicone material is dispersed in a phase of the non-silicone material.

16. The composition according to claim 1, wherein the non-silicone material and the silicone material are mixed to form single phase.

17. A golf ball comprising a composition according to claim 1.

18. A method of making a composition, the method comprising:  
providing a silicone material;  
providing a non-silicone material;  
providing a crosslinking agent;

5 mixing the silicone material, the non-silicone material, and the crosslinking agent together to form a mixture; and

forming a structure from the mixture, wherein the structure is selected from the group consisting of an interpenetrating network structure and a thermoplastic vulcanizate structure.

19. The method according to claim 18, wherein the silicone material, the non-silicone material, and the crosslinking agent are dry-mixed to form the mixture, and the mixture is melt-mixed.

20. The method according to claim 18, wherein the silicone material and the non-silicone material are dry-mixed forming a silicone material and non-silicone material mixture, and the crosslinking agent is added during melt-mixing of the silicone material and non-silicone material mixture.

21. The method according to claim 20, wherein instead of adding the crosslinking agent during melt-mixing of the silicone material and non-silicone material mixture, the crosslinking agent is added to the silicone material and non-silicone material mixture by using methods selected from the group consisting of dipping and spraying.

22. The method according to claim 18, wherein the silicone material is melt-mixed with the crosslinking agent forming a silicone material and crosslinking agent mixture, and the non-silicone material is melt-mixed with the silicone material and the crosslinking agent mixture.

23. The method according to claim 18, wherein the non-silicone material is melt-mixed with the crosslinking agent forming a non-silicone material and crosslinking agent mixture, and the silicone material is dry-mixed with the non-silicone material and the crosslinking agent mixture.

24. The method according to claim 18, further comprising the step of reacting the non-silicone material and the silicone material in the presence of the crosslinking agent; wherein a crosslinking reaction is initiated under conditions selected from the group consisting of an application of heat, an application of uv radiation, and an application of electron beam irradiation to the non-silicone material and the silicone material in the presence of the crosslinking agent.

25. A method of incorporating a composition into a golf ball, the method comprising:

providing the composition including:

a non-silicone material,

a silicone material, and

a crosslinking agent,

wherein the composition forms a structure selected from the group consisting of an interpenetrating network structure and a thermoplastic vulcanizate structure; and

molding the composition to form a spherical layer of the golf ball.

26. The method according to claim 25, wherein the golf ball includes a central portion, and the step of injection molding the composition includes injection molding the composition to form a first half shell and a second half shell, wherein the first half shell and the second half shell are configured to interface with one another.

27. The method according to claim 26, wherein the step of molding the composition further includes compression molding the first half shell and the second half shell over the central portion of the golf ball to form the spherical layer.

28. The method according to claim 25, wherein the step of providing the composition further includes initiating polymerization/crosslinking in the composition.

29. The method according to claim 28, wherein polymerization or crosslinking is initiated in the composition by a step selected from the group consisting of mixing the composition, injection molding the composition, and compression molding the first half shell and the second half shell.

30. The method according to claim 29, wherein polymerization or crosslinking is completed during post-curing.

31. The method according to claim 30, wherein post-curing is accomplished using thermal energy, uv radiation, or electron beam radiation.

32. The method according to claim 25, wherein the spherical layer may be one of many layers formed from a material selected from the group consisting of the composition and other materials.